# Model Implementation Conformance Statement for the IEC 61850 Client Interface in MVI56E-61850C

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# Introduction

This model implementation conformance statement is applicable for the IEC 61850 Ed1 and/or Ed2 client interface in MVI56E-61850C with firmware version 1.01.022. This MICS document specifies the supported Common Data Classes for IEC 61850 Edition 1 and Edition 2 and mapping of the quality.

# Supported Common Data Classes

The "Ed" column indicates Edition 1 and/or Edition 2.

Common data class specifications for status information

| CDC | Ed | Description | Supported | Comment |
|---|---|---|---|---|
| SPS | 1,2 | Single point status | Y | |
| DPS | 1,2 | Double point status | Y | |
| INS | 1,2 | Integer status | Y | |
| ENS | 2 | Enumerated status | Y | |
| ACT | 1,2 | Protection activation information | Y | |
| ACD | 1,2 | Directional protection activation information | Y | |
| SEC | 1,2 | Security violation counting | Y | |
| BCR | 1,2 | Binary counter reading | Y | |
| HST | 2 | Histogram | N | |
| VSS | 2 | Visible string status | Y | |
| Notes: See below. | | | | |

Common data class specifications for measurement information

| CDC | Ed | Description | Supported | Comment |
|---|---|---|---|---|
| MV | 1,2 | Measured value | Y | |
| CMV | 1,2 | Complex measured value | Y | |
| SAV | 1,2 | Sampled value | Y | |
| WYE | 1,2 | Phase to ground/neutral related measured values of a three-phase system | Y | |
| DEL | 1,2 | Phase to phase related measured values of a three-phase system | Y | |
| SEQ | 1,2 | Sequence | Y | |
| HMV | 1 | Harmonic value | N | |
| HMV | 2 | Harmonic value | N | |
| HWYE | 1 | Harmonic value for WYE | N | |
| HWYE | 2 | Harmonic value for WYE | N | |
| HDEL | 1 | Harmonic value for DEL | N | |
| HDEL | 2 | Harmonic value for DEL | N | |
| Notes: See below. | | | | |

Common data class specifications for controls

| CDC | Ed | Description | Supported | Comment |
|---|---|---|---|---|
| SPC | 1,2 | Controllable single point | Y | |
| DPC | 1,2 | Controllable double point | Y | |
| INC | 1,2 | Controllable integer status | Y | |
| ENC | 2 | Controllable enumerated status | Y | |
| BSC | 1,2 | Binary controlled step position information | Y | |
| ISC | 1,2 | Integer controlled step position information | Y | |
| APC | 1 | Controllable analogue process value | N | |
| APC | 2 | Controllable analogue process value | Y | |
| BAC | 2 | Binary controlled analog process value | Y | |
| Notes: See below. | | | | |

Common data class specifications for status settings

| CDC | Ed | Description | Supported | Comment |
|---|---|---|---|---|
| SPG | 1,2 | Single point setting | N | |
| ING | 1,2 | Integer status setting | N | |
| ENG | 2 | Enumerated status setting | N | |
| ORG | 2 | Object reference setting | N | |
| TSG | 2 | Time setting group | N | |
| CUG | 2 | Currency setting group | N | |
| VSG | 2 | Visible string setting | N | |
| Notes: See below. | | | | |

Common data class specifications for analogue settings

| CDC | Ed | Description | Supported | Comment |
|---|---|---|---|---|
| ASG | 1,2 | Analogue setting | N | |
| CURVE | 1,2 | Setting curve | N | |
| CSG | 2 | Curve shape setting | N | |
| Notes: See below. | | | | |

Common data class specifications for description information

| CDC | Ed | Description | Supported | Comment |
|---|---|---|---|---|
| DPL | 1,2 | Device name plate | Y | |
| LPL | 1,2 | Logical node name plate | Y | |
| CSD | 1,2 | Curve shape description | N | |
| Notes: See below. | | | | |

Common data class specifications for tracking

| CDC | Ed | Description | Supported | Comment |
|---|---|---|---|---|
| CST | 2 | Common service tracking | N | |
| BTS | 2 | Buffered report tracking service | N | |
| CTS | 2 | Control tracking service | N | |
| GTS | 2 | GOOSE Control block tracking service | N | |
| LTS | 2 | Log control block tracking service | N | |
| MTS | 2 | MSVCB tracking service | N | |
| NTS | 2 | USVCB control block tracking service | N | |
| OTS | 2 | Log tracking service | N | |
| STS | 2 | SGCB tracking service | N | |
| UTS | 2 | Unbuffered report tracking service | N | |
| Notes: See below. | | | | |

Supported

Y = Client can issue an ASCI service on this CDC and process the data from/to the CDC

N = Client can't issue an ASCI service on this CDC and doesn't process the data from/to the CDC

Notes:

1. Client's purpose is to be a data concentrator on the IEC 61850 network for an associated controller that implements an application determined by the user. It supports MMS polling, report and GOOSE subscriptions, and control operations. All/any CDCs can be mapped for this purpose.
2. Each MMS poll whose functional constraint is not CO is mapped as an MMS "read" operation, executing the service "GetDataValues". Other than timestamps (see below), these data are recorded as received from the 61850 servers and delivered to the controller process unaltered and uninterpreted, and in no way does the client act upon their contents except for such delivery. All data received via subscribed reports and GOOSE are treated this way also.
3. An MMS poll whose functional constraint is CO is mapped as an MMS "write" operation, which ultimately becomes a control operation that executes automatically the control sequence specified by the corresponding "ctlModel" setting. Only the "Oper" DA can be mapped; other CO-constrained DAs cannot be accessed directly but instead are accessed implicitly as specified by the control sequence. The controller issues a control operation by delivering to the module an "Oper" containing some change (not necessarily to the "ctlVal").
4. Functional constraint SP is mapped as MMS "read", so cannot be used to write setpoints. This therefore precludes issuing an Edition 1 APC control operation, updating setpoints in CDCs like SPG and ASG, and turning on tracking functionality in CDCs like BTS and CTS.
5. INT128 is interpreted as INT64. Arrays are not supported.

Quality mapping

| **61850 Quality** | **<client system> quality** |
|---|---|
| Good | See comment below |
| Questionable | See comment below |
| Invalid | See comment below |
| Reserved | See comment below |
| Overflow | See comment below |
| Out of range | See comment below |
| Bad reference | See comment below |
| Oscillatory | See comment below |
| Failure | See comment below |
| Old data | See comment below |
| Inconsistent | See comment below |
| Inaccurate | See comment below |
| Process | See comment below |
| Substituted | See comment below |
| Test | See comment below |
| Operator blocked | See comment below |
| [Comment] | Client records in the module's tag database, and delivers to its associated controller, DA "q" as a 16-bit integer that contains all 13 quality bits exactly as received from the issuing server. Interpretation of those bits, and any consequent action, is the responsibility of the controller, and client does not intervene in that process in any way. |

Time quality mapping

| **61850 Time Quality** | **<client system> quality** |
|---|---|
| Leap seconds known | See comment below |
| Clock not synchronised | See comment below |
| Clock failure | See comment below |
| Accuracy | See comment below |
| [Comment] | Timestamp internal to the MVI56E-61850C module has form {seconds,microseconds} based at epoch of 1970-01-01, with no separate time-quality flags available. Received MMS timestamps are converted to this form with LSK and CNS ignored, CF forcing value {0,0}, and Accuracy determining how many of the MMS fractional bits contribute to the {microseconds}. Issued MMS timestamps are generated from this form by setting LSK on, CNS from module's time-sync status, CF if source {seconds} is 0, and Accuracy as 20 bits (microsecond precision). Timestamp internal to the associated controller has form {microseconds} based at epoch of 1970-01-01, with no time-quality flags. Conversion |

| | |
|---|---|
| | between controller and module forms is automatic as part of the transfer. |